UNIVERSITY OF
ILLINOIS LIBRARY
AT URBANA-CHAMPAIGN
STACKS

Digitized by the Internet Archive
in 2011 with funding from
University of Illinois Urbana-Champaign

http://www.archive.org/details/priceeffectsofmo693simo

Faculty Working Papers

THE PRICE EFFECTS OF MONOPOLISTIC OWNERSHIP IN NEWSPAPERS

Julian L. Simon, Professor, Departments of Economics and Business Administration
Walter J. Primeaux, Jr., Professor, Department of Business Administration
Edward Rice, University of Washington, Seattle

-993

College of Commerce and Business Administration
University of Illinois at Urbana-Champaign

FACULTY WORKING PAPERS

College of Commerce and Business Administration

University of Illinois at Urbana-Champaign

July 29, 1980

THE PRICE EFFECTS OF MONOPOLISTIC OWNERSHIP IN NEWSPAPERS

Julian L. Simon, Professor, Departments of Economics and Business Administration
Walter J. Primeaux, Jr., Professor, Department of Business Administration
Edward Rice, University of Washington, Seattle

#693

Summary

There is disagreement in the literature about whether monopoly ownership of morning and evening newspapers within a city influence advertising rates. This paper investigates the effects of advertising rates of morning and evening newspapers which are separately and/or jointly owned, in cities with a morning and evening newspaper. On most assumptions the price of advertising in either the morning or evening paper, purchased by itself, will be higher with monopoly ownership. But the price of advertising in both the evening and morning paper together is shown to be theoretically undeterminate. This analysis, using data from 1963 and 1976, shows that it is 8-19 percent more expensive to advertise in one paper in a a one-owner town. But it is considerably cheaper to advertise in both papers where both are owned by the same firm.

THE PRICE EFFECTS OF MONOPOLISTIC OWNERSHIP IN NEWSPAPERS

Julian L. Simon, Walter J. Primeaux, Jr. and Edward Rice*

I. INTRODUCTION

There is disagreement in the literature about whether monopoly ownership of morning and evening newspapers within a city influences advertising rates. The most recent review concluded "The effects of media ownership concentration can be expressed in the well-known scotch verdict: 'Not Proved'." (Baer et al., 1974, p. ix). The aim of this paper is to resolve the question.

The study also has a more general implication. The empirical price and allocation effects of monopoly that have been reported in the economic literature have mostly been small relative to relevant magnitudes. These reports have affected the thinking of economists and perhaps of policy makers. As Tullock put it:

> The results have uniformly shown very small costs for practices that economists normally deplore. Judging from conversations with graduate students, a number of young economists are drawing the conclusion that tariffs and monopolies are not of much importance. This view is now beginning to appear in the literature (Tullock, 1973, p. 187).

Newspaper markets provide an unusual opportunity to compare the effect of monopoly against joint ownership. We examine the prices of advertising in cities of comparable size when there are both evening and morning newspapers, in some cases separately owned and in other

---

*Simon and Primeaux are at the University of Illinois at Urbana-Champaign, and Rice is at the University of Washington, Seattle. We acknowledge, with thanks, the research assistance of Randy Nelson and Nikhil Varaiya.

cases owned by a single firm. In contrast to the view Tullock describes, this article shows rather large effects in at least one industry--but in both directions! It may be that similar large effects are obscured from view in interindustry studies because of the immense statistical noise introduced by the structural differences among industries.

Here is some necessary terminology and institutional information. The market structure we call "monopoly" is a single firm owning both the morning and evening newspapers in a given city. A "forced combination" exists when a monopolist owns both morning and evening papers and forces advertisers to buy ads in both papers as a condition of advertising in the single paper of their choice. An "optional combination" monopoly situation is one in which an advertiser can advertise in one or both papers. "Agency" ownership is where the papers are separate editorially but have a common agency to sell their advertising; in all observed cases their production facilities also are common. "Separate ownership" is where the papers are separately owned and operated.

II. SOME THEORY

The "forced combination" purchase of newspaper advertising (advertisers being forced to buy space in both morning and evening papers) has been the subject of a long crusade for abolition or change by the Association of National Advertisers and advertising agencies. As of twenty-five years ago (Borden et al. 1946, pp. 461-464) this subject had come up for review and criticism at annual trade association meetings for over 20 years. According to Borden et al., publishers owning both morning and evening papers have good reason for preferring to quote

a price for only the combination of papers rather than prices for the individual papers: Expenses for selling and handling advertising are proportionally less if advertising orders are taken for the entire circulation covered by both papers rather than for the papers individually. "Some of the lowest millines available in the various circulation groups are these forced combinations . . . " Borden et al. (1946, pp. 461-462).

In an aside which has theoretical import, Borden et al. said:

> [I]f many national advertisers resent a forced combination rate, it would appear to us sound business sense to quote rates for the individual papers. Advertisers would expect the millines for the individual papers to be higher than the millines of the combination buy. To make them arbitrarily high, relative to the norm for the circulation offered, would, however, defeat the purpose of dropping a forced combination, which is to gain and retain customers' goodwill by giving them a fair price for what they want to buy. (1946, p. 464, italics added)

That is, monopolists may price individual newspapers higher than if they did not also offer a combination purchase, so as to increase sales of the combination purchase.

The closest formal theory is Bowman's analysis of tying. The situation discussed by Bowman is clearly reflected in the Times-Picayune case. The Times-Picayune, New Orleans' largest newspaper, required persons wishing to advertise in that morning paper to take identical ads in The States, an evening paper. An antitrust violation, by virtue of a tying arrangement, was charged by the Justice Department. Although the facts in the Times-Picayune case seem to indicate a tying arrangement in an economic sense, the Supreme Court found New Orleans' largest newspaper publisher innocent of violating Sherman Act Section 1. "Notwithstanding the Supreme Court's arguments to the contrary, this was a

clearcut tying arrangement. But it did have the merit of permitting typesetting and composition cost savings." (Scherer, 1970, p. 506)

The two newspaper situation is more complex than comprehended by tying theory, however. These two questions must be addressed: In monopoly, as compared to duopoly, (1) what will be the price of advertising in just one newspaper? (2) what will be the total price of advertising in both newspapers when there are printing cost economies in monopoly? We shall see that the answers depend upon the assumptions made about costs, elasticities and cross-elasticities.

The simplest assumptions will not do. For example, if one makes assumptions akin to those in Stigler's block-booking discussion (1968, Chapter 15)--postulating demands for advertising in the two papers independent of each other, and a single yes-no decision about whether or not to advertise--it is possible to construct cases in which, after a shift to monopoly, (a) all prices go up, (b) the joint price goes down while separate prices go up, or (c) all prices go down. The latter is implausible in light of the simplest static analysis of the effect of lower elasticity of demand in each of two newspapers monopolistically owned and non-interactively competitive than when each is owned separately and each owner is trying to maximize its own profit. Therefore a more complex formal analysis is necessary, one which includes rivalry, cost reductions for the joint product in monopoly, and various possible assumptions about elasticities.

The equilibrium concept we shall use for our duopoly case is a Nash non-cooperative equilibrium, with strategies for the firms defined by the prices they charge (similar to the Bertrand oligopoly model assumption). Advertising in one newspaper is assumed to be an imperfect

substitute for advertising in the other newspaper, and both are imperfect substitutes for a third product--advertising in both newspapers. This should become clearer in the presentation below.

We assume that demand is as follows in the relevant range.

$$Q_1 = A - a_s(P_1 - C_1) + a_D(P_2 - C_2) + a_E(P_3 - C_3)$$

$$Q_2 = A - a_s(P_2 - C_2) + a_D(P_1 - C_1) + a_E(P_3 - C_3)$$

$$Q_3 = B - a_T(P_3 - C_3) + a_B(P_1 - C_1) + a_B(P_2 - C_2)$$

where

$A, B, a_s, a_D, a_E, a_T, a_B$	positive parameters
$Q_i (=Q_1, Q_2, Q_3)$	quantity of advertising demanded (morning paper i = 1, afternoon paper i = 2, both papers i = 3)
$C_i (=C_1, C_2, C_3)$	marginal cost of the i^{th} product (under monopoly for C_3)
$P_i (= P_1, P_2, P_3)$	prices

This demand framework embodies two simplifying assumptions: 1) the demand for each separate paper is symmetric with that of the other separate paper (for exposition only); and 2) all demand curves are linear in all prices.

Marginal costs are assumed constant, and the same for each separate newspaper (i.e., $C_1 = C_2$). Please note that if all goods are priced at marginal cost in the monopoly production situation, A and B represent the quantity demanded of advertising in separate newspapers, and in both newspapers, respectively.

Now, consider the duopoly situation. Here price of the joint advertising necessarily equals the sum of the individual prices; i.e., $P_3 = P_1 + P_2$. Then each duopolist, according to our assumptions, solves

$$\max_{P_i} (P_i - C_i)Q_i + (P_i - C_i)Q_3$$

$$\text{s.t.} \quad P_3 = P_1 + P_2 .$$

Optimum (equilibrium) prices in this case then are*

$$P_1^D = P_2^D = \frac{A + B - (a_T - a_E)(C_1 + C_2 - C_3)}{2a_s + 3a_T - 3(a_B + a_E) - a_D} + C_1$$

$$P_3^D = 2P_1^D .$$

In contrast, the monopolist's maximizes

$$\max_{P_1,P_2,P_3} (P_1 - C_1)Q_1 + (P_2 - C_2)Q_2 + (P_3 - C_3)Q_3$$

$$\text{s.t.} \quad P_1 + P_2 \geq P_3 .$$

If the constraint is not binding, we obtain from the first-order conditions these optimal prices

$$P_1^M = P_2^M = \frac{2A\, a_T + B(a_B + a_E)}{4a_T(a_s - a_D) - 2(a_B + a_E)^2} + C_1$$

$$P_3^M = \frac{B(a_s - a_D) + A(a_B + a_E)}{2a_T(a_s - a_D) - (a_B + a_E)^2} + C_3 .$$

---

*Proofs are in appendix.

These solutions are complex, reflecting some of the complexity of the problem itself. But a few general observations can be made.

1. The monopolists' optimization formula would suffice for managerial decision making purposes. However, a much simpler approximation method using tabular analysis would make less demands on data and require less restrictive assumptions, and would therefore be preferrable. (See Simon, 1975, Chapter 4).

2. With certain constraints upon the parameters to avoid palpably unlikely outcomes—for example, a_T must be at least as great as a_E, for otherwise total advertising increases when P_3 is raised--we can obtain some results about the effect of cost changes. One such is that $\left.\frac{\partial P_3^M}{\partial C_3}\right|_{\substack{\text{Demand} \\ \text{Constant}}} > 0.$*

That is, if there are cost savings in joint production, these will be reflected in lower monopolist prices on the joint product than otherwise. Though the effect of cost reduction on the individual product prices is ambiguous, that monopolist reductions in both joint and individual prices following cost reduction in joint production is a possibility.

3. Examination of the optimizing solutions for P_3^D and P_3^M shows non-linear terms and interactive effects. This suggests that there is not likely to be any unidirectional conclusion that can be drawn about the relationship of P_3^M to P_3^D. And experiments with differencing the two optima and other analytic devices did indeed not reveal any simple

---

*Proof of this proposition is in the appendix. The proof requires making some further reasonable assumptions about the nature of the demand system.

conclusion, even in this case of linear demand functions. More conclusively, we have constructed examples with the demand function alone (i.e., assuming no change in joint cost) that show that all sorts of outcomes are possible if duopoly becomes monopoly (or vice versa). Two such example follow:

Example A: Close substitutes. If there is high substitutability between the three products, then there will be large effects of one product's price upon the other products' demand. In our model this means that a_D, a_E, and a_B will be large relative to a_s and a_T.

In such a situation, the monopolizing effect of joint ownership is likely to predominate, and all prices will rise. For example, suppose

$$a_s = .3 \quad a_D = .15 \quad a_B = .07 \quad B = 25 \quad A = 30$$
$$a_T = .15 \quad a_E = .04 \quad C_1 = 100 \quad C_2 = 100 \quad C_3 = 200$$

Substituting into our optimum solutions,

$$P_1^D = P_2^D = \$196.49 \qquad P_1^M = P_2^M = \$278.57$$
$$P_3^D = \$392.98 \qquad P_3^M = \$414.29$$

As expected, both prices are higher with monopoly ownership in this case.

Example B: Not close substitutes, demand for the joint product more elastic. If there is not close substitutability in the demand for the three products, price discrimination considerations will likely dominate. If the demand for the joint product is more elastic than the demand for the individual newspapers at duopoly prices, the monopolist

is likely to raise the individual product prices and lower the joint product price.

For example, let

$$a_s = .3 \quad a_D = .08 \quad a_B = .04 \quad B = 25 \quad A = 30$$
$$a_T = .15 \quad a_E = .02 \quad C_1 = 100 \quad C_2 = 100 \quad C_3 = 200$$

Notice that here the cross-coefficients (a_D, a_B, and a_E) are approximately half what they were in Example A. The solutions are

$$P_1^D = P_2^D = \$169.62 \qquad P_1^M = P_2^M = \$185.13$$
$$P_3^D = \$339.24 \qquad P_3^M = \$316.98$$

As expected, joint price is lower but individual prices are higher with monopoly ownership.*

In short, the model implies that unambiguous predictions about price behavior are impossible when newspapers switch from duopoly to monopoly ownership. What happens will depend on three separate factors and their relative importance: 1) substitutability between products, which causes all monopoly prices to be higher, ceteris paribus; 2) price elasticity differences, which cause a lower monopoly joint-product price and higher individual prices if the joint product has higher elasticity; 3) cost savings from joint production, which cause lower monopoly joint-product price, and an uncertain effect on individual product prices.

---

*Please note that at the duopoly prices, the price elasticity of demand for the joint product is \$5.25, while for the individual products it is \$2.91. Also note that we are not explicitly considering the (relatively uninteresting) situation where the individual product demand is more elastic, since price discrimination in this direction is ruled out by buyer arbitrage. The sum of the individual prices must be at least as great as the joint product price, otherwise demanders would simply buy two separate ads and effectively obtain a joint product.

There is still another reason to think that the comparative joint-product price levels are theoretically indeterminate. The duopoly price level, $P_3^D = P_1^D + P_2^D$, depends upon the extent of competition between the duopolist, and it has been shown that no one price can be deduced as the unique duopoly equilibrium (see Simon, Puig and Aschoff, 1973).*

The variety of possible effects in theory means that empirical investigation is necessary. The remainder of the paper is devoted to that task.

III. PREVIOUS STUDIES

Simon and Bowers (Simon, 1970, p. 152-163) constructed a set of pairwise comparisons of cities of similar size. These showed that if the advertiser wishes to purchase advertising in only a morning or evening newspaper, it is cheaper to do so with separate ownership, but if the advertiser wishes to purchase advertising in both morning and evening newspapers, it is cheaper to do so if there is monopoly ownership.

Gretta (1970) examined advertising rates before and after a shift from separate ownership to monopoly ownership. He found that the price of advertising in a single paper was higher after the merger. He did not offer a conclusion about the monopoly effect on single-paper advertising.

The main objective of Owen (1973) was to study the effect of joint ownership of newspapers and television stations. Most of his work was

---

*By assuming Nash equilibrium with price strategies, we are imposing a particular form of competition.

with the advertising rate unadjusted for newspaper circulation, which is not appropriate for our purposes here (and, it has been argued by others, for Owen's other purposes as well). But Owen did show results of a single regression for the milline-rate cost of advertising in both evening and morning papers in 1969. Separate ownership is associated with a rate approximately 13.5% higher.

As noted in the introduction, the sum of this earlier evidence has not convinced interested persons that any effect has been proven conclusively, probably both because of shortcomings in the data and analysis, and because of a lack of theory.

IV. PROCEDURE AND DATA

The all-important "irrelevant" variable which must be controlled is total circulation. The relationship of circulation to price is seen in plots to be rather clearly logarithmic, and it is therefore entered into the regressions in that form. The market-structure variable is handled with a two-way dummy. Equations are of the form:

$$Y = a + b_1X_1 + b_2X_2$$

where: Y = milline rate charged by the newspaper, in natural logs

X_1 = circulation in numbers of newspapers sold, in natural logs

X_2 = a zero-one dummy variable to reflect difference in levels of concentration.

We collected data for the years 1963 and 1976. Adding yearly observations adds information. However, the advertising rates of newspapers are highly correlated from year to year, and hence the additional

information value of additional yearly samples at closer intervals is limited. In light of the expected cost and benefit of that additional information, and in light of our results, we believe that the 1963 and 1976 samples taken together give us a satisfactory picture of the situation. The data for the two years were collected separately by different graduate students, which adds to our confidence in our empirical results.

A three-step procedure was followed to assign the firms to market structure categories. First, firms were selected from the list provided in Bowers (1966). Second, a cross check of this list was conducted by using data from Standard Rate and Data Service. If Bowers listed a firm as offering an optional combination but only a forced rate was actually offered to advertisers, the firm was classified in the forced market category. If a firm was listed by Bowers as offering only a forced combination but an optional combination was actually offered, the firm was moved to the optional market structure. Third, Editor and Publisher of 1963 and 1976 was inspected to determine if two same-city firms were joined by a common advertising agency; papers operating with this type of arrangement are called "agency papers" and an agency market structure is included in the analysis.

Firms were excluded from the sample when published data were incomplete. Also, all observations for a city were excluded from the sample if one of the papers had discontinued publication since 1963. The size of the sample varied depending upon the market structure being examined at any given time. The number of firms representing each market structure type, for each year, is shown in Tables 1, 2, and 3.

RESULTS

Tables 1-3 present the results of regressions for advertising in evening newspapers and morning newspapers separately, and for both papers together, respectively, in the various market structures.

Before we proceed to our main topic, it is worth noting that the circulation variable in every regression indicates large effects of scale, the elasticity ranging from -.25 to -.53. In regressions run separately on the various classes of newspapers; the range is -.22 to -.51, and the mean elasticity is -.38. That is, doubling the circulation reduces the cost of reaching a reader with a page of advertising by 38%. When one remembers that daily newspapers range in circulation from less than 10,000 to nearly two million in the U.S.--in our sample the range is from 14,131 to 722,897--the importance of these price effects of scale becomes clear. How much of this effect is due to economies in newspaper preparation, how much to the selling and processing of advertising, and how much to physical production, is not known to us.

Now on to our main business.

Advertising in One Paper

Evening newspapers considered by themselves, and morning newspapers considered by themselves, are much the same economically; therefore we shall analyze the two cases together though keeping the samples separate. We pool the 1963 and 1976 results to increase the generality of our results. But we also present comparisons in the two separate years because there can be change over time.

For evening and morning newspapers purchased alone, the dummy-variable coefficients in the top line of Tables 1 and 2 show that it is 8% to 19% cheaper to advertise in a separately-owned paper than when both the morning and evening papers are owned by the same firm.* The result is much the same in 1963 and in 1976. The coefficient for morning papers in 1976 would not be significant if examined alone, but given that its sign is consistent with the other three observations, we can be confident that the result is not a statistical artifact, though it may signal a shift over time. A comparison of pairs of papers at similar circulations for 1963 (Table 3) suggests that the differential is even greater than shown by the less flexible dummy variable technique, say 20-30%, and the consistency of the results is also made clear in the pairwise comparisons.

The second lines in Tables 1 and 2 show the comparisons of agency (cartel) operation to separate operation: Agency prices are higher (though not so much so in 1976 as to be statistically significant if that were the only data available; this may indicate a shift over time).

The results in the third lines in Tables 1 and 2 show no pattern of differences between agency ownership and monopoly ownership.

The difference between monopolies and agencies on the one hand, and individual ownership on the other hand, together with the similarity of agencies to joint ownership, may be due either to production economies

---

*The coefficients on the dummy variables may not immediately be interpreted as percent differences. Since the base differs, depending upon the level at which the change occurs, the coefficients must be converted to percentage differences by referring to a table of exponential functions. The percentage differences mentioned in this section were converted by using the table in Selby (1967, p. 141).

of scale (the agency papers are produced jointly), or to the power to set prices for both papers together. Our data do not allow us to discriminate between the two explanations.

Advertising in Evening and Morning Newspapers Together

Table 4 shows the results for the comparisons of the various patterns of control and sale of advertising in morning and evening newspapers together.

Lines 1 and 2 contain the most important results. Line 1 shows the comparison of morning-plus-evening advertising bought from separately-owned papers versus a purchase from a monopolist who forces the advertiser to buy the advertising as a package. Line 2 compares a combination purchase from separate owners against an optional combination purchase from a monopolist. Both comparisons make very clear that an advertiser pays 25% to 30% less when buying from a monopolist. The size and the certainty of this effect may be seen in detail in the sample of 1963 pairwise comparisons available at similar circulation rates, in Table 5.

The result--that monopoly prices are lower--runs against general economic expectations. But it does accord with the theory developed earlier.

Line 3--comparing agency rates to separate-ownership rates--shows a result quite similar to the comparisons in lines 1 and 2. This suggests that agencies price in a manner quite similar to monopoly ownership. This confirms our result about the lowering of joint-purchase prices with joint control and production.

Lines 4 and 5 show no noticeable difference between combination prices charged by agencies and by single ownership. These comparisons fit together with line 3 to show that agencies act like the cartels that they are. Taken altogether, the results yield a strong and consistent pattern: Joint control produces lower prices when one advertises in both morning and evening papers together.

Line 6 shows no differences between optional and forced combinations in 1963, but a statistically-large effect in 1976 (forced combinations apparently charging less). Whether this represents a real change or a statistical artifact cannot be known without additional data. Nor is it of great interest for this paper; we present it mostly for completeness.

V. DISCUSSION

In addition to our theory given earlier, there is another approach to the monopolist's behavior, which results in observed higher single-paper prices and lower joint prices, implicit in the statement of Borden et al. quoted earlier. We can observe that the higher is the single-paper price, the greater the likelihood that the customer will advertise in both papers together. That is, the spread between the single-paper and joint-paper prices may be thought of as a price tool of the monopolist. This would be difficult to show formally or even with examples, because of the inter-relationship between this effect and the tendency of single-paper prices to be higher in monopoly due to the simplest elasticity effect. It can, however, easily be shown with sequential analysis of likely decision-making thinking when going for duopoly to

monopoly with the cost structure remaining the same, but we will not bore the reader with this. But there is ample empirical evidence that this logic actually operates. The behavior of monopolists who force all advertisers to advertise in both papers, offering no individual-paper rates, clearly shows a tendency for this spread-widening to happen; the price of having to buy advertising in both papers in order to advertise in just one newspaper, even if that is all that you want, is a very high price, indeed, and hence the spread is very great in that case.

Evaluating the impact of monopoly is difficult because in most industries, e.g., auto manufacturing or canned ham, there is only one market. Most studies of monopoly have therefore been comparisons across industries (Schwartzman, 1959; 1960 is an exception). And, the results of such comparisons across industries are always subject to the important qualification that the observed differences may stem from the specific natures of the industries, rather than from the degree of concentration and the other independent variables.

There are two main empirical strategies in the social sciences, which are used respectively in economics and in psychology. Economists usually aim at wide coverage of the economy and therefore use the cross-industry approach, with all its strengths and weaknesses. In contrast, psychologists examine the behavior of a narrow sample of homogeneous subject matter under tightly controlled conditions, for example, a laboratory experiment using rats to study a topic in learning theory. In this paper, as in Primeaux (1975), we adopt a research strategy more akin to that of the psychologists, by working with a homogeneous sample of the same type of firm in a sample of locations. While this strategy limits generality, it increases the reliability of the empirical analysis.

VI. SUMMARY AND CONCLUSIONS

This paper investigates the effect on advertising rates of morning and evening newspapers being separately owned or jointly owned, in cities with a morning and an evening newspaper. On most assumptions the price of advertising in either the morning or the evening paper, purchased by itself, will be higher with monopoly ownership. But the price of advertising in both the evening and morning paper together is shown to be theoretically indeterminate. Therefore we examined data for 1963 and 1976. We found that it is 8-19% more expensive to advertise in one paper in a one-owner town. But it is considerably cheaper to advertise in both papers where both are owned by the same firm. Whether this is due to production economies of scale or a pricing scheme that would lead to this result even in the absence of economies of scale we do not know. Separately-owned papers that produce and sell jointly have prices similar to single-owner situations.

REFERENCES

Walter S. Baer et al., Concentration of Mass Media Ownership: Assessing the State of Current Knowledge (Santa Monica: The Rand Corporation, 1974).

Walter S. Baer et al., Newspaper-Television Station Cross-Ownership: Options for Federal Action (Santa Monica: The Rand Corporation, 1974).

Neil H. Borden, Malcomb D. Taylor, and Howard T. Hovde, National Advertising in Newspapers (Cambridge: Harvard University Press, 1946).

Ian C. Bowers, An Analysis of the Influence of the Competitive Structure Upon Daily Newspapers' Display Advertising Rates and Linage, unpublished M.A. thesis, University of Illinois, 1966.

Ian C. Bowers and Julian L. Simon, "The Effect of Geographic Monopoly on the Price of Newspaper Advertising" in Issues in the Economics of Advertising (Urbana: University of Illinois Press, 1970), pp. 151-157.

Ward S. Bowman, "Tying Arrangements and the Leverage Problem." Yale Law Journal, Vol. LXVIII, November, 1957.

Editor and Publisher, 1963 and 1976.

G. L. Grotta, Changes in Ownership Structure of Daily Newspapers and Selected Performance Characteristics, 1960-1968: An Investigation of Some Economic Implications of Concentration of Ownership, Ph.D. Dissertation, Southern Illinois University, 1970.

Bruce M. Owen, "Newpaper and Television Station Joint Ownership." Antitrust Bulletin, Vol. XVIII, Winter, 1973.

Walter J. Primeaux, Jr., "A Reexamination of the Monopoly Market Structure for Electric Utilities," Promoting Competition in Regulated Markets, edited by Almarin Phillips, (Washington, D.C., The Brookings Institution, 1975).

F. M. Scherer, Industrial Market Structure and Economic Performance (Chicago: Rand McNally & Co., 1970).

David Schwartzman, "The Effect of Monopoly on Price." Journal of Political Economy, Vol. 67, August, 1959.

Samuel M. Selby (ed.), Standard Mathematical Tables (Cleveland: The Chemical Rubber Co., 1967).

Julian L. Simon, Issues in the Economics of Advertising (Urbana: University of Illinois Press, 1970).

Julian L. Simon, Applied Managerial Economics (Englewood Cliffs: Prentice-Hall, 1975).

Julian L. Simon, C. Puig, and John Aschoff, "Duopoly Simulations and Theory: An End to Cournot," The Review of Economic Studies, Vol. XL, July 1973.

Standard Rate and Data Service: Newspaper Rates and Data, October 6, 1963.

George J. Stigler, The Organization of Industry, (Homewood: Irwin, 1968).

Gordon Tullock, "The Welfare Costs of Monopolies and Theft," in Price Theory in Action (Boston: Houghton-Mifflin Company, 1973).

M/C/46

TABLE 1

Equations for Advertising Prices for Evening Papers

Line		1963 Constant	1963 Circulation	1963 Dummy	1963 % Result Dummy	1963 $\bar{R}^2$	1963 n	1976 Constant	1976 Circulation	1976 Dummy	1976 % Result Dummy	1976 $\bar{R}^2$	1976 n
1	2 owner evening vs. 1 owner evening Dummy = 1 for 1 owner	10.81	-.41 (-10.56)*	.16 (2.07)**	+17%	.77	17 43	11.91	-.45 (-8.88)*	.17 (1.61)**	+19%	.74	14 38
2	2 owner evening vs. Agency evening Dummy = 1 for Agency	10.89	-.41 (-8.75)*	.20 (2.60)*	+22%	.83	14 17	10.50	-.33 (-4.17)*	.12 (.95)	+13%	.55	13 14
3	1 owner evening vs. Agency evening Dummy = 1 for 1 owner	11.71	-.48 (-11.79)*	-.07 (-.99)	- 7%	.71	14 43	12.28	-.48 (-8.42)*	.14 (1.41)	+15%	.61	13 38

*Significant at 1 percent level
**Significant at 5 percent level
t statistics in parentheses

TABLE 2

Equations for Advertising Prices for Morning Papers

Line		1963 Constant	1963 Circulation	1963 Dummy	1963 % Result Dummy	1963 $\bar{R}^2$	1963 n	1976 Constant	1976 Circulation	1976 Dummy	1976 % Result Dummy	1976 $\bar{R}^2$	1976 n
1	1 owner morning vs. 2 owner morning Dummy = 1 for 1 owner	9.96	-.35 (-11.38)*	.13 (2.57)*	+14%	.76	43 17	11.83	-.44 (-9.48)*	.08 (.94)	+ 8%	.69	38 14
2	2 owner morning vs. Agency morning Dummy = 1 for Agency	9.88	-.34 (-7.40)*	.21 (3.21)*	+23%	.77	14 17	10.08	-.30 (-3.56)*	.08 (.65)	+ 8%	.45	13 14
3	1 owner morning vs. Agency morning Dummy = 1 for 1 owner	10.26	-.35 (-9.03)*	-.08 (-1.37)	- 8%	.59	43 14	12.03	-.47 (-7.95)*	.12 (1.32)	+13%	.55	38 13

*Significant at 1 percent level
**Significant at 5 percent level
t statistics in parentheses

TABLE 3

Pairwise Comparisons of National Advertising Rates for Newspapers in Separate-Ownership and Optional-Combination Market Structures, 1963

1	2	3	4	5
Circulation	Separate-Ownership Rate	Optional Combination Rate	Difference: (Col.3-Col.2)	Col. 4÷ Col. 2
		A. Evening Papers		
60,000	$5.35	$5.69	$+ .34	+ .06
75,000	3.85; 4.31 [4.08]	5.52	+1.44	+ .38
85,000	3.43	5.00	+1.57	+ .46
130,000	2.98	8.30; 4.84; 4.28; 3.38; 4.33 [5.03]	+2.05	+ .69
170,000	3.24	4.18; 3.99 [4.09]	+ .85	+ .26
200,000	2.88	3.99	+1.11	+ .38
225,000	3.04; 3.13 [3.09]	2.65	- .44	- .14
340,000	2.97; 2.93 [2.95]	2.75	- .20	- .07
360,000	2.55	3.07	+ .52	+ .20
		B. Morning Papers		
30,000	$6.55	$11.50; 8.92; 5.20; 8.21 [8.47]	$+1.92	+ .29
35,000	7.03	8.52	+1.49	+ .21
40,000	5.71	7.43	+1.72	+ .30
55,000	4.58	4.81; 5.10; 6.29; 7.96 [6.04]	+1.46	+ .32
95,000	3.45	4.29; 5.64; [4.96]	+1.51	+ .44
130,000	2.64	3.43	+ .79	+ .30
160,000	2.74; 3.67 [3.20]	3.96	+ .76	+ .24
170,000	2.33; 2.61 [2.47]	3.57	+1.10	+ .45
195,000	3.26	3.92	+ .66	+ .20
225,000	3.16; 2.62 [2.89]	3.25	+ .36	+ .12

TABLE 4

Equations for Advertising Prices for Combination Papers

Line		1963 Constant	1963 Circulation	1963 Dummy	1963 % Result Dummy	1963 $\bar{R}^2$	1963 n	1976 Constant	1976 Circulation	1976 Dummy	1976 % Result Dummy	1976 $\bar{R}^2$	1976 n
1	2 owner comb vs. forced Dummy = 1 for 1 owner	10.10	-.35 (-12.04)*	-.22 (4.19)*	-25%	.78	17 42	10.98	-.35 (-6.93)*	-.26 (2.78)*	-30%	.61	14 30
2	2 owner comb vs. 1 owner opt. Dummy = 1 for 1 owner	9.54	-.30 (-12.61)*	-.18 (4.48)*	-20%	.74	17 43	12.88	-.50 (-6.94)*	-.26 (1.94)**	-30%	.51	14 38
3	2 owner comb vs. 1 owner agency Dummy = 1 for 1 owner	9.47	-.30 (-7.83)*	-.16 (2.90)*	-17%	.67	17 14	9.65	-.25 (-3.69)*	-.23 (2.42)*	-26%	.31	14 13
4	Agency comb vs. forced comb Dummy = 1 for forced	10.10	-.35 (-9.86)*	-.017 (-.40)	+ 1%	.70	14 42	10.23	-.32 (-4.67)*	.08 (1.10)	+ 8%	.48	13 30
5	Agency combo vs. 1 owner opt Dummy = 1 for agency	9.40	-.29 (-10.74)*	.010 (.28)	+ 1%	.67	14 43	12.59	-.51 (-6.34)*	-.19 (-1.59)**	-17%	.47	13 38
6	1 owner opt vs. forced comb Dummy = 1 for forced	9.85	-.33 (-13.95)*	.013 (.47)	+ 1%	.74	43 42	12.75	-.53 (-8.20)*	-.23 (-2.86)*	-21%	.49	38 30

*Significant at 1 percent level
**Significant at 5 percent level
t statistics in parentheses

TABLE 5

Pairwise Comparisons of National Advertising Rates for Morning and Evening Newspapers Taken in Competitive, Forced-Combination and Optional-Combination Structures, 1963

1	2	3	4	5	6	7	8
Circulation	"Competitive" Rate	Forced-Combination Rate	Difference Col. 3 − Col. 2	Col. 4 ÷ Col. 2	Optional-Combination Rate	Difference Col. 6 − Col. 2	Col. 7 ÷ Col. 2
90,000	6.19	4.00; 3.50 3.80; 4.90	-2.14	-.346	3.49	-2.70	-.446
105,000	5.20	4.42; 3.96 [4.19]	-1.01	-.194	4.54	- .66	-.126
115,000	5.01	3.57; 4.00 [3.79]	-1.22	-.243	3.21; 4.41 [3.81]	-1.20	-.239
180,000	3.44	2.72	-0.72	-.209	3.18	-0.26	-.075
225,000	3.91	3.91	-0.00	-.000	2.86; 3.26 3.28 [3.20]	-0.71	-.181
230,000	3.59	2.60	-0.99	-.275	2.88	-0.71	-.198
295,000	4.10	--	--	--	3.06; 2.97 [3.01]	-1.09	-.266

APPENDIX

This appendix derives the duopoly and monopoly price solutions and proves the proposition that $\partial P_3^M/\partial C_3 > 0$ stated in the text. It thus explicitly solves the maximization problems referred to in the text (and imposes the Nash-Bertrand equilibrium in the duopoly case).

Duopoly Solution

Let $K_i = P_i - C_i$ for each product i. Then, the optimization for duopolist firm 1 (morning newspaper) is

$$\max_{P_1} \quad K_1 (Q_1 + Q_3).$$

Taking the derivative with respect to P_1, one obtains the first-order condition

$$Q_1 + Q_3 + K_1 \left(\frac{\partial Q_1}{\partial P_1} + \frac{\partial Q_3}{\partial P_1}\right) = 0.$$

From the form of the demand functions assumed, noting that in the duopoly case $P_3 = P_1 + P_2$, this reduces to

$$Q_1 + Q_3 + K_1 (-a_s + a_E + a_B - a_T) = 0$$

$$A + B + (a_B - a_s) K_1 + (a_B + a_D) K_2 + (a_E - a_T) K_3 + K_1 (a_E + a_B - a_s - a_T) = 0$$

$$A + B + (a_B + a_D) K_2 + (a_E - a_T) K_3 + (a_E + 2a_B - 2a_s - a_T) K_1 = 0. \tag{A1}$$

Let $C_s = C_1 + C_2 - C_3$. Then note that

$$K_3 = P_3 - C_3$$

$$= (P_1 + P_2) - (C_1 + C_2) + (C_1 + C_2 - C_3)$$

$$K_3 = K_1 + K_2 + C_s. \tag{A2}$$

Substituting (A2) into (A1) and combining terms

$$A + B + (a_E - a_T)\, C_s + (a_B + a_D + a_E - a_T)\, K_2 + 2(a_E + a_B - a_s - a_T)\, K_1 = 0$$

$$\text{(A3)} \qquad K_1^* = \frac{A + B + (a_E - a_T)\, C_s + (a_B + a_D + a_E - a_T)\, K_2}{2(a_s + a_T - a_B - a_E)} \quad .$$

Now, the solution for duopolist 2 is exactly the same as for 1, in (A3), except duopolist 2 switches K_1 and K_2. By invoking this symmetry relationship in the case of linear functions we know that $K_1^* = K_2^*$.

Thus, from (A3), in equilibrium,

$$2(a_s + a_T - a_B - a_E)\, K_1^* = A + B + (a_E - a_T)\, C_s + (a_B + a_D + a_E - a_T)\, K_1^*$$

$$(2a_s + 3a_T - 3a_B - 3a_E - a_D)\, K_1^* = A + B + (a_E - a_T)\, C_s$$

$$\text{(A4)} \qquad K_1^* = \frac{A + B + (a_E - a_T)\, C_s}{2a_s + 3a_T - 3a_B - 3a_E - a_D} \quad .$$

Equation (A4) is reorganized in the text as

$$\text{(A5)} \qquad P_1^* = \frac{A + B - (a_T - a_E)\, C_s}{2a_s + 3a_T - 3(a_B + a_E) - a_D} + C_1 \quad .$$

Monopoly Solution

The monopolist problem is

$$\max_{P_1, P_2, P_3} \quad K_1 Q_1 + K_2 Q_2 + K_3 Q_3.$$

Setting the partial derivative with respect to P_1 equal to zero yields

$$Q_1 + K_1 \frac{\partial Q_1}{\partial P_1} + K_2 \frac{\partial Q_2}{\partial P_1} + K_3 \frac{\partial Q_3}{\partial P_1} = 0$$

or

$$Q_1 - a_s K_1 + a_D K_2 + a_B K_3 = 0.$$

Substituting from the demand function for Q_1,

$$A - 2a_s K_1 + 2a_D K_2 + (a_B+a_E) K_3 = 0$$

$$\text{(A6)} \qquad K_1^* = \frac{A + 2a_D K_2 + (a_B+a_E) K_3}{2a_s} \quad .$$

By symmetry, the first order condition for P_2 yields

$$\text{(A7)} \qquad K_2^* = \frac{A + 2a_D K_1 + (a_B+a_E) K_3}{2a_s} \quad .$$

Differentiating with respect to P_3, the resulting first order condition is

$$Q_3 + K_3 \frac{\partial Q_3}{\partial P_3} + K_1 \frac{\partial Q_1}{\partial P_3} + K_2 \frac{\partial Q_2}{\partial P_3} = 0$$

or $$Q_3 - a_T K_3 + a_E(K_1 + K_2) = 0 \ .$$

Substituting for Q_3 from the demand equations,

$$B + (a_B+a_E)(K_1+K_2) - 2a_T K_3 = 0$$

$$\text{(A8)} \qquad K_3^* = \frac{B + (a_B+a_E)(K_1+K_2)}{2a_T} \quad .$$

Examining first-order conditions (A6), (A7), and (A8), one first notices that the symmetry and linearity of (A6) and (A7) implies that $K_1^* = K_2^*$. This fact reduces (A6) to

$$K_1^* = \frac{A + (a_B+a_E) K_3}{2a_s} + \frac{a_D}{a_s} K_1^*$$

$$(a_s-a_D) K_1^* = \frac{A + (a_B+a_E) K_3}{2}$$

$$\text{(A9)} \qquad K_1^* = \frac{A + (a_B+a_E) K_3}{2(a_s-a_D)} \quad .$$

Substituting (A9) into (A8) and noting that $K_1^* = K_2^*$,

$$K_3^* = \frac{B}{2a_T} + \frac{(a_B+a_E)[A + (a_B+a_E)\ K_3^*]}{2a_T(a_s-a_D)}$$

$$K_3^* = \frac{B(a_s-a_D) + A(a_B+a_E)}{2a_T(a_s-a_D)} + \frac{(a_B+a_E)^2}{2a_T(a_s-a_D)}\ K_3^*$$

$$K_3^*\ [2a_T(a_s-a_D) - (a_B+a_E)^2] = B(a_s-a_D) + A(a_B+a_E)$$

(A10) $$K_3^* = \frac{B(a_s-a_D) + A(a_B+a_E)}{2a_T(a_s-a_D) - (a_B+a_E)^2} \quad .$$

Substituting (A10) into (A9) gives

$$K_1^* = \frac{1}{2(a_s-a_D)} \{A + \frac{(a_B+a_E)\ [B(a_s-a_D) + A(a_B+a_E)]}{2a_T(a_s-a_D) - (a_B+a_E)^2}\}$$

$$= \frac{1}{2(a_s-a_D)} \{\frac{2A\ a_T(a_s-a_D) + B(a_B+a_E)(a_s-a_D)}{2a_T(a_s-a_D) - (a_B+a_E)^2}\}$$

(A11) $$K_1^* = \frac{2A\ a_T + B(a_B+a_E)}{4a_T(a_s-a_D) - 2(a_B+a_E)^2} \quad .$$

Equations (A11) and (A10), reported in price form in the text, translate to

(A12) $$P_1^* = P_2^* = \frac{2A\ a_T + B(a_B+a_E)}{4a_T(a_s-a_D) - 2(a_B+a_E)^2} + C_1, \text{ and}$$

(A13) $$P_3^* = \frac{B(a_s-a_D) + A(a_B+a_E)}{2a_T(a_s-a_D) - (a_B+a_E)^2} + C_3 \quad .$$

Proof that $\partial P_3^M/\partial C_3 > 0$

As stated in the footnote in the text, to keep demand constant while C_3 changes, we must change A and B simultaneously. The relevant equation is

$$\left.\frac{\partial P_3^M}{\partial C_3}\right|_{\substack{\text{Demand}\\\text{Constant}}} = \frac{\partial P_3^M}{\partial C_3} + a_E \frac{\partial P_3^M}{\partial A} - a_T \frac{\partial P_3^M}{\partial B} .$$

From (A13) then,

$$\left.\frac{\partial P_3^M}{\partial C_3}\right|_{DC} = 1 + \frac{a_E(a_B+a_E) - a_T(a_s-a_D)}{2a_T(a_s-a_D) - (a_B+a_E)^2}$$

$$= \frac{2a_T(a_s-a_D) - (a_B+a_E)^2 + a_E(a_B+a_E) - a_T(a_s-a_D)}{2a_T(a_s-a_D) - (a_B+a_E)^2}$$

(A14) $$\left.\frac{\partial P_3^M}{\partial C_3}\right|_{DC} = \frac{a_T(a_s-a_D) - a_B(a_B+a_E)}{2a_T(a_s-a_D) - (a_B+a_E)^2} .$$

Now, we assume that a \$1 rise in P_1 and P_2, coupled with a \$2 rise in P_3 would result in smaller Q_1, Q_2 and Q_3.
This implies that

(A15) $$a_T > a_B$$

for otherwise Q_3 would rise in the situation described.

We further assume that raising any one price will result in less total advertising $(2Q_3 + Q_1 + Q_2)$.
This implies that

(A16) $$a_s > a_D + 2a_B \qquad \text{and}$$

(A17) $$a_T > a_E.$$

Also note that the denominator of (A13) must be positive for an interior solution.

Then, from (A14), using (A16),

$$\left.\frac{\partial P_3^M}{\partial C_3}\right|_{DC} > \frac{a_T\,(2a_B) - a_B^2 - a_B\,a_E}{2a_T(a_s-a_D) - (a_B+a_E)^2}$$

$$\left.\frac{\partial P_3^M}{\partial C_3}\right|_{DC} > \frac{a_B\,[(a_T-a_B) + (a_T-a_E)]}{2a_T(a_s-a_D) - (a_B+a_E)^2} \quad \text{(A18)}$$

The denominator of (A18) is positive since it is the same as the denominator of (A13). The numerator of (A18) must be positive from (A17) and (A15). Hence, the entire (A18) must be positive and our proof is complete.

LIBRARY U. OF I. URBANA-CHAMPAIGN

BOUND BY
HN
3.94

UNIVERSITY OF ILLINOIS-URBANA
3 0112 060296263